

**Remarks/Arguments**

The Applicant respectfully request further examination and reconsideration in view of the above amendments and arguments set forth fully below. Claims 1, 8-27, 29-33, 35-132 were pending. Claims 9, 11, 15, 18, 20-27, 33, 35-37, 39, 42, 43, 45-127 are withdrawn from consideration. By the above amendments, Claims 1, 129, and 132 are amended. Claim 131 is canceled. Accordingly, Claims 1, 8-27, 29-33, 35-130, and 132 are currently pending.

**Claim Amendments**

\_\_\_\_\_By above amendments, Claims 1, 129, and 132 have been amended. Claim 1 has been amended to incorporate Claim 131. The amendments are made for clarity and no new issues have been added.

**Claim Rejections Under 35 U.S.C. §112**

Within the Office Action, Claims 1, 8, 10, 12-14, 16, 17, 19, 29-32, 38, 40, 41, 44, and 128-132 are rejected under 35 U.S.C. §112, second paragraph. Specifically, it states that “‘fingers’ in claim 1 and all subsequent claims does not specify which of the ‘fingers’ (i.e. those of the first set or those of the second set) applicant is referring to in subsequent recitations of the word ‘fingers.’ This renders the claims ambiguous.”

By above amended, Claims 1, 129, and 132 have been amended. Claim 131 is canceled. The term “fingers” in Claim 1 has been amended to refer “first set of the one or more fingers and the second set of the one or more fingers,” and the term “fingers” in 132 has been amended to “first set, the second set, or both sets of fingers.”

Further, it is stated in the Office Action that “the recitation in claim 132 that the inlet point, inlet channel and fingers are ‘substantially planner’ appears to be mis-descriptive.”

By above amended, Claim 132 has been amended to recite “the inlet channel and the first set, the second set, or both sets of fingers are substantially in a plane”

Currently, Claims 1, 8, 10, 12-14, 16, 17, 19, 29-32, 38, 40, 41, 44, 128-130, and 132 comply with the requirements of 35 U.S.C. §112. The applicants respectfully request the rejections to be withdrawn.

**Claim Rejections Under 35 U.S.C. §103**

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 32, 38, 40, and 128-132 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of U.S. Patent No. 5,388,635 to Gruber et al (hereinafter Gruber) and U.S. Patent No. 5,761,037 to Anderson et al (hereinafter Anderson). Specifically, Gruber is cited in the Office Action as a teaching of “the at least one inlet port directs fluid from an inlet channel coupled to the at least one port to a first set of fingers which branches from the inlet channel to a second set of fingers which branches from the first set of fingers.” It is stated in the Office Action that

Gruber, assigned, to IBM, shows in Figures 3, 4, 8A and 8B a system for cooling a heat source. A structure 20 defines an inlet port 28 that channels fluid to a first set of fingers 30 that branch out in a plurality of directions from the inlet port. The first set of fingers 30 branches from an inlet channel to a second set of fingers 32 (see Figure 3 and 4). The second set of fingers feed fluid to an intermediate plate 16 that has a plurality of holes extending therethrough. (Emphasis added) [Office Action, Page 5]

The Applicants respectfully disagree. To further the prosecution, Claim 1 has been amended to include “at least one inlet port directs fluid from an inlet channel coupled to the at least one inlet port to a first set of one or more fingers and a second set of one or more fingers, wherein the first set of ... **fingers branch from the inlet channel**, wherein the **second set of ... fingers branch from the inlet channel**, so that the fluid is able to flow from the first set of ... fingers and the second set of the one or more fingers to the heat exchanging layer, ... wherein at least a portion .. of the first set of the ... fingers is **nonparallel** to at least a portion ... of the second set of the... fingers.” (Emphasis added) [Present Application, Claim 1]

If the supply ducts 30 of Gruber were the **first set of fingers** and the supply channels 32 of Gruber were the **second set of fingers** as stated in the Office Action, Gruber does not teach an **inlet channel**, which *branches out a first/second set of fingers and couples with a inlet port and the first/second set of fingers*. [Gruber, Fig. 2 and 3, col. 8, line 55- col. 9, line 49]

In the case even if the supply ducts 30 of Gruber were treated as the inlet channel and the supply channels 32 of Gruber were treated as the **first and the second sets of fingers**, Gruber still does not teach “at least a portion of the first set of the ... fingers is **nonparallel** to a portion ... of the second set of the... fingers,” because the supply channels 32 of Gruber are all parallel to each other. [Gruber, Fig. 2 and 3, col. 8, line 55- col. 9, line 49]

As described above, Gruber does not teach “first set of ... **fingers branch from the inlet channel**, wherein the **second set of ... fingers branch from the inlet channel**” and “at least a portion .. of the **first set of the ... fingers** is **nonparallel** to a portion ... of the second set of the...

**fingers.”** Anderson is cited in the Office Action for other purposes. Anderson does not teach above claim elements. [Office Action, page 8]

The independent Claim 1 is directed to a heat exchanger. The heat exchanger comprises a body having a conducting portion configured to be in contact with a heat source along a plane, wherein the conducting portion is configured to conduct heat from the heat source to a heat exchanging layer configured within the body, the body including at least one inlet port and at least one outlet port, wherein the at least one inlet port directs fluid from an inlet channel coupled to the at least one inlet port to a first set of one or more fingers and a second set of one or more fingers, wherein the first set of the one or more fingers branch from the inlet channel, wherein the second set of the one or more fingers branch from the inlet channel, so that the fluid is able to flow from the first set of the one or more fingers and the second set of the one or more fingers to the heat exchanging layer via an intermediate layer with a plurality of conduits which extend therethrough, wherein at least a portion of one of the first set of the one or more fingers is nonparallel to at least a portion of one of the second set of the one or more fingers, the heat exchanging layer includes a porous microstructure disposed thereon and is configured to distribute the fluid and to pass the distributed fluid therethrough. As described above, neither Gruber, Anderson, nor their combination teaches “first set of ... **fingers branch from the inlet channel**, wherein the **second set of ... fingers branch from the inlet channel**” and “at least a portion .. of the first set of the ... fingers is **nonparallel** to a portion ... of the second set of the... fingers.” For at least these reasons, the independent Claim 1 is allowable over the teachings of Gruber, Anderson, and their combination.

Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 are all also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 32, 38, 40, and 128-132 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber and Anderson and U.S. Patent No. 3,993,123 to Chu et al (hereinafter Chu) or U.S. Patent No. 5,978,220 to Frey et al (hereinafter Frey). The Applicants respectfully disagree.

As described above, Gruber does not teach “first set of ... **fingers branch from the inlet channel**, wherein the **second set of ... fingers branch from the inlet channel**” and “at least a portion .. of the first set of the ... fingers is **nonparallel** to a portion ... of the second set of the... fingers.” Further, Anderson, Chu, and Frey do not teach above claim elements. [Office Action,

page 10] For at least these reasons, the independent Claim 1 is allowable over the teachings of Gruber, Anderson, Chu, Frey and their combination.

Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 are all also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 32, 38, 40, and 128-132 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber/Anderson or Gruber/Anderson/Chu/Frey as applied to claims 1, 8, 10, 12-14, 17, 19, 32, 38, 40, and 128-132 above and further in view of either U.S. Patent No. 5,983,997 to Hou et al (hereinafter Hou) or U.S. Patent No. 5,239,200 to Messina et al (hereinafter Messina). The Applicants respectfully disagree.

As described above, Gruber does not teach “first set of ... **fingers branch from the inlet channel**, wherein the **second set of ... fingers branch from the inlet channel**” and “at least a portion .. of the first set of the ... fingers is **nonparallel** to a portion ... of the second set of the... fingers.” Further, Anderson, Chu, Frey, Hou, Messina, and their combination do not teach above claim elements. [Office Action, page 10] For at least these reasons, the independent Claim 1 is allowable over the teachings of Gruber, Anderson, Chu, Frey, Hou, Messina, and their combination.

Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 are all also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claim 16 is rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber/Anderson alone or Gruber/Anderson/Chu/Frey alone or in view of Hou or Messina as applied to claim 1 above, and further in view of U.S. Patent No. 4,758,926 to Herrell et al (hereinafter Herrell) The Applicants respectfully disagree.

As described above, the independent Claim 1 is allowable over the teachings of Gruber, Anderson, Chu, Frey, Hou, Messina, and their combination.

Claim 16 is dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claim 16 is also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 29-32 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber/Anderson alone or Gruber/Anderson/Chu/Frey alone or in view of Hou or Messina as applied to claim 1 above, and further in view of U.S. Patent No. 6,680,044 to Tonkovich et al (hereinafter Tonkovich). The Applicants respectfully disagree.

As described above, the independent Claim 1 is allowable over the teachings of Gruber, Anderson, Chu, Frey, Hou, Messina, and their combination.

Claims 29-32 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 29-32 are also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 29-32, 38, 40, and 128-132 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber in view of the Jiang et al article “Thermal-Hydraulic performance of small scale micro-channel and porous-media heat exchangers (hereinafter Jiang).” The Applicants respectfully disagree.

As described above, Gruber does not teach “first set of ... **fingers branch from the inlet channel**, wherein the **second set of ... fingers branch from the inlet channel**” and “at least a portion .. of the first set of the ... fingers is **nonparallel** to a portion ... of the second set of the... fingers.” Further Jiang does not teach above claim elements. [Office Action, page 14] For at least these reasons, the independent Claim 1 is allowable over the teachings of Gruber, Jiang, and their combination.

Claims 8, 10, 12-14, 17, 19, 29-32, 38, 40, 128-130, and 132 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 8, 10, 12-14, 17, 19, 29-32, 38, 40, 128-130, and 132 are all also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 29-32, 38, 40, and 128-132 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber in view of the Jiang and Chu or Frey. The Applicants respectfully disagree.

As described above, Gruber does not teach “first set of ... **fingers branch from the inlet channel**, wherein the **second set of ... fingers branch from the inlet channel**” and “at least a portion .. of the first set of the ... fingers is **nonparallel** to a portion ... of the second set of the... fingers.” Further Jiang does not teach above claim elements. [Office Action, page 14] For at

least these reasons, the independent Claim 1 is allowable over the teachings of Gruber, Jiang, Chu, Frey, and their combination.

Claims 8, 10, 12-14, 17, 19, 29-32, 38, 40, 128-130, and 132 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 8, 10, 12-14, 17, 19, 29-32, 38, 40, 128-130, and 132 are all also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 29-32, 38, 40, and 128-132 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber in view of the US Patent No. 4,896,719 to O'Neill et al. (hereinafter, O'Neill) and Tonkovich. The Applicants respectfully disagree.

As described above, Gruber does not teach “first set of ... **fingers branch from the inlet channel**, wherein the **second set of ... fingers branch from the inlet channel**” and “at least a portion .. of the first set of the ... fingers is **nonparallel** to a portion ... of the second set of the... fingers.” Further O'Neill and Tonkovich do not teach above claim elements. [Office Action, page 17] For at least these reasons, the independent Claim 1 is allowable over the teachings of Gruber, O'Neill, Tonkovich, and their combination.

Claims 8, 10, 12-14, 17, 19, 29-32, 38, 40, 128-130, and 132 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 8, 10, 12-14, 17, 19, 29-32, 38, 40, 128-130, and 132 are all also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 29-32, 38, 40, and 128-132 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber in view of O'Neill, Tonkovich, Chu or Frey. The Applicants respectfully disagree.

As described above, Gruber does not teach “first set of ... **fingers branch from the inlet channel**, wherein the **second set of ... fingers branch from the inlet channel**” and “at least a portion .. of the first set of the ... fingers is **nonparallel** to a portion ... of the second set of the... fingers.” Further O'Neill and Tonkovich do not teach above claim elements. [Office Action, page 17] For at least these reasons, the independent Claim 1 is allowable over the teachings of Gruber, O'Neill, Tonkovich, Chu, Frey and their combination.

Claims 8, 10, 12-14, 17, 19, 29-32, 38, 40, 128-130, and 132 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 8, 10, 12-

14, 17, 19, 29-32, 38, 40, 128-130, and 132 are all also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 41 and 44 are rejected under 35 U.S.C. §103(a) as obvious over any of the prior art references as applied to claim 1 above, and further in view of US Patent No. 5,918,469 to Cardella (hereinafter Cardella) or WO 01/25711 A1. The Applicants respectfully disagree.

As described above, the independent Claim 1 is allowable over the teachings of all of the prior art references as applied to claim 1 above.

Claims 41 and 44 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 41 and 44 are both also allowable as being dependent upon an allowable base claim.

Applicants' responses that are applicable to the prior Office Action are all herein incorporated by reference.

### **Conclusion**

For the reasons given above, the Applicant respectfully submits that the claims are in a condition for allowance, and allowance at an early date would be appreciated. If the Examiner has any questions or comments, he is encouraged to call the undersigned at (408) 530-9700 so that any outstanding issues can be expeditiously resolved.

Respectfully submitted,  
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